

SEQUENCE LISTING

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<120> STEM CELL MAINTENANCE FACTOR MATERIALS AND METHODS

<130> 28110/35905A

<140> To be assigned

<141> Filed herewith

<150> 09/378,667

<151> 1999-08-20

<150> 09/687,527

<151> 2000-10-12

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Val Xaa Ala Arg Thr Leu Asn Lys Gln Gly Met Met Met Ser Ile Ala
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acc aag atc gct atg cag atg act tgc aag ctc gga ggc gag ctg tgg 145

Thr Lys Ile Ala Met Gln Met Thr Cys Lys Leu Gly Gly Glu Leu Trp
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gct gtg gaa ata cct tta aag tcc ctg atg gtg gtc ggt att gat gtc 193

Ala Val Glu Ile Pro Leu Lys Ser Leu Met Val Val Gly Ile Asp Val
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tgt aaa gat gca ctc agc aag gac gtg atg gtt gtt gga tgc gtg gcc 241

Cys Lys Asp Ala Leu Ser Lys Asp Val Met Val Val Gly Cys Val Ala
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"sheet" sheet

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Cys Lys Asp Ala Leu Ser Lys Asp Val Met Val Val Gly Cys Val Ala
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Arg Thr Met Thr Asp Val Ala Asp Cys Leu Lys Val Phe Met Thr Gly
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Ala Leu Asn Lys Trp Tyr Lys Tyr Asn His Asp Leu Pro Ala Arg Ile
115 120 125
Ile Val Tyr Arg Ala Gly Val Gly Asp Gly Gln Leu Lys Thr Leu Ile
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Met Lys Asp Leu Ala Val His Thr Arg Leu Thr Pro Glu Gln Arg Gln
65 70 75 80
Arg Glu Val Gly Arg Leu Ile Asp Tyr Ile His Lys Asn Asp Asn Val
85 90 95
Gln Arg Glu Leu Arg Asp Trp Gly Leu Ser Phe Asp Ser Asn Leu Leu
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Ser Phe Ser Gly Arg Ile Leu Gln Thr Glu Lys Ile His Gln Gly Gly
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Lys Thr Phe Asp Tyr Asn Pro Gln Phe Ala Asp Trp Ser Lys Glu Thr
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1009494-1009494

Arg Gly Ala Pro Leu Ile Ser Val Lys Pro Leu Asp Asn Trp Leu Leu
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 Ile Tyr Thr Arg Arg Asn Tyr Glu Ala Ala Asn Ser Leu Ile Gln Asn
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 Leu Phe Lys Val Thr Pro Ala Met Gly Met Gln Met Arg Lys Ala Ile
 180 185 190
 Met Ile Glu Val Asp Asp Arg Thr Glu Ala Tyr Leu Arg Val Leu Gln
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 Gln Lys Val Thr Ala Asp Thr Gln Ile Val Val Cys Leu Leu Ser Ser
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 Asn Arg Lys Asp Lys Tyr Asp Ala Ile Lys Lys Tyr Leu Cys Thr Asp
 225 230 235 240
 Cys Pro Thr Pro Ser Gln Cys Val Val Ala Arg Thr Leu Gly Lys Gln
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 Lys Met Gly Gly Glu Leu Trp Arg Val Asp Ile Pro Leu Lys Leu Val
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 Met Ile Val Gly Ile Asp Cys Tyr His Asp Met Thr Ala Gly Arg Arg
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 Ser Ile Ala Gly Phe Val Ala Ser Ile Asn Glu Gly Met Thr Arg Trp
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 Glu Tyr Met Pro Ser Arg Ile Ile Val Tyr Arg Asp Gly Val Gly Asp
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 Gly Gln Leu Lys Thr Leu Val Asn Tyr Glu Val Pro Gln Phe Leu Asp
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 Cys Leu Lys Ser Ile Gly Arg Gly Tyr Asn Pro Arg Leu Thr Val Ile
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 Val Val Lys Lys Arg Val Asn Thr Arg Phe Phe Ala Gln Ser Gly Gly
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 Arg Pro Glu Trp Tyr Asp Phe Phe Ile Val Ser Gln Ala Val Arg Ser
 435 440 445
 Gly Ser Val Ser Pro Thr His Tyr Asn Val Ile Tyr Asp Asn Ser Gly
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 Leu Lys Pro Asp His Ile Gln Arg Leu Thr Tyr Lys Leu Cys His Ile
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Tyr Tyr Asn Trp Pro Gly Val Ile Arg Val Pro Ala Pro Cys Gln Tyr
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Gly Asn Gly Gly Gly Gly Asp Ala Gln Val Gly Pro Ser Ile Glu Lys
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Ser Ser Leu Ser Ala Val Gln Met His Lys Ser Glu Gly Asp Pro Arg
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Gly Ser Val Arg Gly Arg Arg Leu Ile Thr Asp Leu Val Tyr Ser Arg
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Pro Pro Gly Met Thr Ser Lys Lys Gly Val Val Gly Thr His Ile Thr
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Val Gln Ala Asn Tyr Phe Lys Val Leu Lys Arg Pro Asn Trp Thr Ile
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Tyr Gln Tyr Arg Val Asp Phe Thr Pro Asp Val Glu Ala Thr Arg Leu
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Arg Arg Ser Phe Leu Tyr Glu His Lys Gly Ile Leu Gly Gly Tyr Ile
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Phe Asp Gly Thr Asn Met Phe Cys Ile Asn Gln Phe Lys Ala Val Gln
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Asp Ser Pro Tyr Val Leu Glu Leu Val Thr Lys Ser Arg Ala Gly Glu
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Ala Glu Gln Phe Gln Val Leu Asn Leu Ile Leu Arg Arg Ala Met Glu
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Gly Leu Asp Leu Lys Leu Val Ser Arg Tyr Tyr Tyr Asp Pro Gln Ala
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1002345678901

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Cys	His	Lys	Val	Met	Arg	Thr	Glu	Thr	Leu	Tyr	Asn	Ile	Leu	Ser	Asp
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Ala	Ile	Arg	Asp	Ser	Asp	Asp	Tyr	Gln	Ser	Thr	Phe	Lys	Arg	Ala	Val
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Asp	Asp	Val	Asp	Phe	Gln	Ser	Thr	Pro	Leu	Cys	Lys	Phe	Lys	Thr	Asn
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Asp	Gly	Glu	Ile	Ser	Tyr	Val	Asp	Tyr	Tyr	Lys	Lys	Arg	Tyr	Asn	Ile
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				405						410		415			
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Val	Glu	Ile	Pro	Ala	Arg	Val	Leu	Pro	Pro	Glu	Lys	Ile	Leu	Phe	Gly
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Val Asp Arg Pro Val Pro Ser Gln Val Val Thr Leu Lys Val Ile Ala
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Pro Arg Gln Gln Lys Pro Thr Gly Leu Met Ser Ile Ala Thr Lys Val
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Val Ile Gln Met Asn Ala Lys Leu Met Gly Ala Pro Trp Gln Val Val
610 615 620

Ile Pro Leu His Gly Leu Met Thr Val Gly Phe Asp Val Cys His Ser
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Pro Lys Asn Lys Asn Lys Ser Tyr Gly Ala Phe Val Ala Thr Met Asp
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Gln Lys Glu Ser Phe Arg Tyr Phe Ser Thr Val Asn Glu His Ile Lys
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675 680 685

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690 695 700

Phe Arg Asp Gly Val Gly Asp Gly Gln Leu Tyr Gln Val Val Asn Ser
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Glu Val Asn Thr Leu Lys Asp Arg Leu Asp Glu Ile Tyr Lys Ser Ala
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Gly Lys Gln Glu Gly Cys Arg Met Thr Phe Ile Ile Val Ser Lys Arg
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Val Val Asp Asp Val Ile Thr Leu Pro Glu Arg Tyr Asp Phe Phe Leu
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Val Ser Gln Ala Val Arg Ile Gly Thr Val Ser Pro Thr Ser Tyr Asn
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Val Ile Ser Asp Asn Met Gly Leu Asn Ala Asp Lys Leu Gln Met Leu
805 810 815

Ser Tyr Lys Met Thr His Met Tyr Tyr Asn Tyr Ser Gly Thr Ile Arg
820 825 830

Val Pro Ala Val Cys His Tyr Ala His Lys Leu Ala Phe Leu Val Ala
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Lys	Gln	Pro	Gly	Glu	Pro	Pro	Gln	Val	Asn	Tyr	Ile	Val	Pro	Glu	Leu	
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Cys	Phe	Pro	Thr	Gly	Leu	Thr	Asp	Glu	Met	Arg	Lys	Asp	Phe	Lys	Met	
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Met	Leu	Ala	Asp	Asp	Asn	Lys	Thr	Arg	Tyr	Asp	Ser	Leu	Lys	Lys	Tyr	405	410	415	
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Ile	Val	Leu	Lys	Ile	Val	Leu	Gln	Met	Ile	Cys	Lys	Thr	Gly	Gly	Ala	450	455	460	
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Asp	Leu	Tyr	His	Asp	Ser	Thr	Leu	Lys	Gly	Lys	Thr	Val	Gly	Ala	Cys	485	490	495	
Val	Ser	Thr	Thr	Ser	Asn	Asp	Phe	Thr	Gln	Phe	Tyr	Ser	Gln	Thr	Arg	500	505	510	
Pro	His	Glu	Asn	Pro	Thr	Gln	Leu	Gly	Asn	Asn	Leu	Thr	His	Phe	Val	515	520	525	
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Ser	Arg	Leu	Ile	Leu	Tyr	Arg	Asp	Gly	Ala	Gly	Asp	Gly	Gln	Ile	Pro	545	550	555	560
Tyr	Ile	Lys	Asn	Thr	Glu	Val	Lys	Leu	Val	Arg	Asp	Ala	Cys	Asp	Ala	565	570	575	
Val	Thr	Asp	Lys	Ala	Ala	Glu	Leu	Ser	Asn	Lys	Val	Gln	Glu	Lys	Ile	580	585	590	
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1005945-100604

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Asp Tyr Ser Ile Tyr Gln Tyr His Val Glu Phe Glu Pro Thr Val Asp
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Ser Lys Ala Asn Arg Glu Lys Met Leu Arg Asp Asn Asn Val Thr Asp
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Glu Ile Gly His His Phe Val Phe Asp Gly Met Ile Leu Tyr Leu Lys
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Glu Glu Trp Glu Gln Asn Gln Met Ile Glu Val Gln His Pro Ile Asp
115 120 125

Arg Ser Leu Ile Cys Ile Arg Phe Lys Gln Thr Asn Arg Phe Leu Val
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Ser	Pro	Gln	Gln	Arg	Leu	Val	Glu	Ser	Arg	Lys	Leu	Ile	Val	Asp	Leu		
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Ser	Lys	Asn	Glu	Lys	Val	Met	Glu	Cys	Phe	Lys	Tyr	Trp	Gly	Ile	Ser		
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Lys	Phe	Ile	Glu	Glu	Ala	Arg	Arg	Leu	Gly	Lys	Ile	Leu	Gln	Val	Gln		
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Leu	Gly	Glu	Pro	Met	Cys	Val	Pro	Ile	Arg	Gly	Ile	Ser	Pro	Asn	Asp		
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Tyr	Leu	Glu	Gly	Val	Lys	Gly	Ala	Ile	Lys	Gln	Val	Asp	Gly	Glu	Asp		
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Ile His Met Leu Val Val Met Leu Ala Asp Asp Asn Lys Thr Arg Tyr
500 505 510

Asp Ser Leu Lys Lys Phe Leu Cys Val Glu Cys Pro Ile Pro Asn Gln
515 520 525

Cys Val Asn Leu Arg Thr Leu Ala Gly Lys Ser Lys Asp Gly Gly Glu
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Cys Lys Thr Gly Gly Ala Leu Trp Lys Val Asn Ile Pro Leu Lys Asn
565 570 575

Thr Met Ile Val Gly Tyr Asp Leu Tyr His Asp Ser Thr Leu Lys Gly
580 585 590

Lys Thr Val Gly Ala Cys Val Ser Thr Thr Ser Asn Asp Phe Thr Gln
595 600 605

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Asn Leu Thr His Phe Val Arg Lys Ala Leu Lys Gln Tyr Tyr Asp Ser
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Asn Asp Gln Thr Leu Pro Ser Arg Leu Ile Leu Tyr Arg Asp Gly Ala
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Gly Asp Gly Gln Ile Pro Tyr Ile Lys Asn Thr Glu Val Lys Leu Val
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Arg Asp Ala Cys Asp Ala Val Thr Asp Lys Ala Ala Glu Leu Ser Asn
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Lys Val Gln Glu Lys Ile Lys Leu Ala Phe Ile Ile Val Thr Lys Arg
690 695 700

Val Asn Met Arg Ile Leu Lys Gln Gly Ser Ser Leu Asp Asn Ala Ile
705 710 715 720

Asn Pro Gln Pro Gly Thr Val Val Asp Thr Thr Val Thr Arg Pro Glu
725 730 735

Arg Met Asp Phe Tyr Leu Val Pro Gln Phe Val Asn Gln Gly Thr Val
740 745 750

Thr Pro Val Ser Tyr Asn Ile Ile His Asp Asp Thr Asp Leu Gly Pro
755 760 765

Asp Lys His Gln Gln Leu Ala Phe Lys Leu Cys His Leu Tyr Tyr Asn
770 775 780

Trp Gln Gly Thr Val Arg Val Pro Ala Pro Cys Gln Tyr Ala His Lys
785 790 795 800

Leu Ala Phe Leu Thr Ala Gln Ser Leu His Asp Asp Ala Asn Gly Cys
805 810 815

1002495-1002496

Leu Arg Asp Lys Leu Phe Phe Leu
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Phe Arg Gly Ser Ser Ser Gly Asp Pro Arg Ala Asp Pro Arg Ile Glu
35 40 45
Ala Ser Arg Glu Arg Arg Ala Leu Glu Glu Ala Pro Arg Arg Glu Gly
50 55 60
Gly Pro Thr Glu Arg Lys Pro Trp Gly Asp Gln Tyr Asp Tyr Leu Asn
65 70 75 80
Thr Arg Pro Ala Glu Leu Val Ser Lys Lys Gly Thr Asp Gly Val Pro
85 90 95
Val Met Leu Gln Thr Asn Phe Phe Arg Leu Lys Thr Lys Pro Glu Trp
100 105 110
Arg Ile Val His Tyr His Val Glu Phe Glu Pro Ser Ile Glu Asn Pro
115 120 125
Arg Val Arg Met Gly Val Leu Ser Asn His Ala Asn Leu Leu Gly Ser
130 135 140
Gly Tyr Leu Phe Asp Gly Leu Gln Leu Phe Thr Thr Arg Lys Phe Glu
145 150 155 160
Gln Glu Ile Thr Val Leu Ser Gly Lys Ser Lys Leu Asp Ile Glu Tyr
165 170 175
Lys Ile Ser Ile Lys Phe Val Gly Phe Ile Ser Cys Ala Glu Pro Arg
180 185 190
Phe Leu Gln Val Leu Asn Leu Ile Leu Arg Arg Ser Met Lys Gly Leu
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Asn Leu Glu Leu Val Gly Arg Asn Leu Phe Asp Pro Arg Ala Lys Ile
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Glu Ile Arg Glu Phe Lys Met Glu Leu Trp Pro Gly Tyr Glu Thr Ser
225 230 235 240
Ile Arg Gln His Glu Lys Asp Ile Leu Leu Gly Thr Glu Ile Thr His
245 250 255
Lys Val Met Arg Thr Glu Thr Ile Tyr Asp Ile Met Arg Arg Cys Ser
260 265 270

TOP20T "55462001"

His	Asn	Pro	Ala	Arg	His	Gln	Asp	Glu	Val	Arg	Val	Asn	Val	Leu	Asp
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Leu	Ile	Val	Leu	Thr	Asp	Tyr	Asn	Asn	Arg	Thr	Tyr	Arg	Ile	Asn	Asp
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Val	Asp	Phe	Gly	Gln	Thr	Pro	Lys	Ser	Thr	Phe	Ser	Cys	Lys	Gly	Arg
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Asp	Ile	Ser	Phe	Val	Glu	Tyr	Tyr	Leu	Thr	Lys	Tyr	Asn	Ile	Arg	Ile
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Arg	Asp	His	Asn	Gln	Pro	Leu	Leu	Ile	Ser	Lys	Asn	Arg	Asp	Lys	Ala
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Arg	Val	Thr	Gly	Leu	Asn	Ala	Glu	Met	Arg	Ser	Asn	Phe	Gln	Leu	Met
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Arg	Ala	Met	Ser	Ser	Tyr	Thr	Arg	Met	Asn	Pro	Lys	Gln	Arg	Thr	Asp
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Arg	Leu	Arg	Ala	Phe	Asn	His	Arg	Leu	Gln	Asn	Thr	Pro	Glu	Ser	Val
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Lys	Val	Leu	Arg	Asp	Trp	Asn	Met	Glu	Leu	Asp	Lys	Asn	Val	Thr	Glu
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Gln	Arg	Met	Leu	Thr	Thr	Pro	Ser	Asp	Gly	Leu	Asp	Arg	Trp	Ala	Val
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Leu	Tyr	Arg	Ala	Ala	Ser	Gly	Met	Gly	Leu	Arg	Ile	Arg	Ser	Pro	Gln
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Glu	Phe	Ile	Ile	Tyr	Asp	Asp	Arg	Thr	Gly	Thr	Tyr	Val	Arg	Ala	Met
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Cys	Lys	Leu	Gly	Tyr	Thr	Pro	Trp	Met	Ile	Glu	Leu	Pro	Leu	Ser	Gly
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Leu	Met	Thr	Ile	Gly	Phe	Asp	Ile	Ala	Lys	Ser	Thr	Arg	Asp	Arg	Lys
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Thr	Tyr	Phe	Ser	Thr	Val	Thr	Glu	Cys	Ser	Ala	Phe	Asp	Val	Leu	Ala
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Asn	Thr	Leu	Trp	Pro	Met	Ile	Ala	Lys	Ala	Leu	Arg	Gln	Tyr	Gln	His
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Glu	His	Arg	Lys	Leu	Pro	Ser	Arg	Ile	Val	Phe	Tyr	Arg	Asp	Gly	Val
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Ser	Ser	Gly	Ser	Leu	Lys	Gln	Leu	Phe	Glu	Phe	Glu	Val	Lys	Asp	Ile
	690					695					700				
Ile	Glu	Lys	Leu	Lys	Thr	Glu	Tyr	Ala	Arg	Val	Gln	Leu	Ser	Pro	Pro
705					710					715					720
Gln	Leu	Ala	Tyr	Ile	Val	Val	Thr	Arg	Ser	Met	Asn	Thr	Arg	Phe	Phe
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Leu	Asn	Gly	Gln	Asn	Pro	Pro	Pro	Gly	Thr	Ile	Val	Asp	Asp	Val	Ile
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Gln	Gly	Thr	Val	Ser	Pro	Thr	Ser	Tyr	Asn	Val	Leu	Tyr	Ser	Ser	Met
	770					775					780				
Gly	Leu	Ser	Pro	Glu	Lys	Met	Gln	Lys	Leu	Thr	Tyr	Lys	Met	Cys	His
785					790					795					800
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Tyr	Ala	Lys	Lys	Leu	Ala	Thr	Leu	Val	Gly	Thr	Asn	Leu	His	Ser	Ile
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gcc acc aag atc gct atg cag atg act tgc aag ctc gga ggc gag ctg Ala Thr Lys Ile Ala Met Gln Met Thr Cys Lys Leu Gly Gly Glu Leu 240 245 250	831
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tca aat acc agc tca aga ctg tgc gtg att gtg gtc agg aag aag tgc Ser Asn Thr Ser Ser Arg Leu Ser Val Ile Val Val Arg Lys Lys Cys 370 375 380	1215
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tac tat aat gtc atc tat gat gac aac ggc ttg aag ccc gac cat atg Tyr Tyr Asn Val Ile Tyr Asp Asp Asn Gly Leu Lys Pro Asp His Met 430 435 440 445	1407
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Ser Glu Lys Ile Leu Met Gln Asp His Ile Cys Gln Pro Val Ser Ala
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Ala	Glu	Ser	Phe	Leu	Asn	Cys	Leu	Arg	Arg	Val	Ala	Gly	Ser	Met	Gly		
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Ser Ser Arg Leu Ser Val Ile Val Val Arg Lys Lys Cys Met Pro Arg
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Phe Phe Thr Glu Met Asn Arg Thr Val Gln Asn Pro Pro Leu Gly Thr
385 390 395 400

Val Val Asp Ser Glu Ala Thr Arg Asn Glu Trp Tyr Asp Phe Tyr Leu
405 410 415

Ile Ser Gln Val Ala Cys Arg Gly Thr Val Ser Pro Thr Tyr Tyr Asn
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Val Ile Tyr Asp Asp Asn Gly Leu Lys Pro Asp His Met Gln Arg Leu
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Thr Phe Lys Leu Cys His Leu Tyr Tyr Asn Trp Pro Gly Ile Val Ser
450 455 460

Val Pro Ala Pro Cys Gln Tyr Ala His Lys Leu Thr Phe Leu Gly Ala
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protein database

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